WHAT IS CLAIMED IS:

1. A beam rotation angle detecting apparatus comprising:

a light receiving portion for detecting the incidence positions of at least two beams moving on concentric circles while forming a track as a circle or an arc; and

an arithmetic system for calculating and outputting the angle between a straight line linking at least two incidence positions detected by said light receiving portion together and a predetermined reference line.

2. The apparatus of Claim 1, wherein said light receiving portion is of a circular ring shape and is disposed substantially concentrically with the circles on which said beams move.

3. The apparatus of Claim 1, wherein said light receiving portion has a plurality of independent light receiving elements continuously constructed on the circumferences of the circles on which said beams move.

4. The apparatus of Claim 2, wherein said light receiving portion has at least two circular ring-shaped portions.

5. The apparatus of Claim 1, wherein said light receiving portion executes the detection independently in each of a plurality of angle areas.

6. The apparatus of Claim 5, wherein said light receiving portion has the function of selecting said angle areas on which said beams are to be incident in conformity with the rotation thereof.

7. The apparatus of Claim 2, wherein said light receiving portion has the function of independently detecting said at least two beams in conformity with the difference between the characteristics thereof.

8. A rotation detecting apparatus comprising:

two members rotatable relative to each other, at least one of said two members having the function of forming on the other member at least two beams moving on concentric circles while forming a track as a circle or an arc in conformity with said relative rotation;

a light receiving portion provided on said other member, said light receiving portion detecting the incidence positions of said at least two beams; and

an arithmetic system for calculating and outputting the angle between a straight line linking at least two incidence positions detected by said light receiving portion together and a predetermined

reference line, the information of said relative rotation being detected by said angle calculation.

9. The apparatus of Claim 8, wherein said one member has at least two light emitting portions for producing said beams moving while describing said circle or arc.

10. The apparatus of Claim 9, wherein said at least two light emitting portions are disposed so that the centers of rotation of said beams moving while describing said circle or arc may coincide with the center of said light receiving portion.

11. The apparatus of Claim 8, wherein said one member has at least two light transmitting windows for the incident light from the back side of said member to form said beams moving while describing said circle or arc.

12. The apparatus of Claim 8, further comprising a condensing optical system or an orifice for making said at least two beams into light spots on said light receiving portion.

13. The apparatus of Claim 8, wherein said one member has light deflecting means for changing the

direction of incidence of the beams incident on said light receiving portion with the rotation of said member.

14. The apparatus of Claim 13, wherein said light deflecting means has at least two reflecting members.

15. The apparatus of Claim 13, wherein said light deflecting means has at least two refracting members.

16. The apparatus of Claim 13, wherein said light deflecting means has a diffraction grating.

17. The apparatus of Claim 13, wherein said light deflecting means is formed with a plurality of patterns of a predetermined cross-sectional shape forming a reflecting surface forming a predetermined angle with respect to the relative rotation plane of said one member, said patterns being continuously formed in parallel to said rotation plane.

18. The apparatus of Claim 17, wherein said patterns of a predetermined cross-sectional shape are linear grooves or projections, or recesses of at least triangular polygonal pyramidal shape.

19. The apparatus of Claim 13, wherein said light

deflecting means is formed with a plurality of patterns of a predetermined cross-sectional shape forming a refracting surface forming a predetermined angle with respect to the relative rotation plane of said one member, said patterns being continuously formed in parallel to said rotation plane.

20. The apparatus of Claim 19, wherein said patterns of a predetermined cross-sectional shape are linear grooves or projections, or recesses of at least triangular polygonal pyramidal shape.

21. The apparatus of Claim 1, wherein said arithmetic system adds angle information corresponding to two or more incidence positions selected from among a plurality of beam incidence positions detected by said light receiving portions.

22. The apparatus of Claim 4, wherein said arithmetic system divides the incidence position outputted by said light receiving portion by values proportional to the radius of said light receiving portion or the radius of the circle or arc described by said incident beam, and thereafter adds and outputs angle information corresponding to two or more incidence positions selected from the divided result.

23. The apparatus Claim 22, wherein at least one of the values proportional to said radius is normalized when calculated by said arithmetic system.

24. The apparatus of Claim 21, wherein the angle information corresponding to said incidence positions is added, whereafter it is divided by the number of the added incident beams.

25. The apparatus of Claim 4, wherein said light receiving portion has a number of light receiving elements proportional to the radius thereof.

26. The apparatus of Claim 3, wherein the detection of the incidence positions of said beams uses a value corresponding to the ratio between quantities of light incident on adjacent two of said plurality of light receiving elements.

27. The apparatus of Claim 3, wherein the outputs of said plurality of light receiving elements are successively outputted in predetermined order at predetermined timing, and said output signals are detected to thereby find angle information corresponding to a plurality of beam incidence positions.

28. The apparatus of Claim 3, further comprising means for producing an address at predetermined timing, selecting at least one from the plurality of independent light receiving elements on the basis of the signal of said address and putting out the output of said light receiving element, and detecting said output signal to thereby obtain angle information corresponding to a plurality of beam incidence positions.

29. The apparatus of Claim 28, further comprising address setting means for setting the value of said address so as to produce an address corresponding to the light receiving element from near the beam incidence position detected by said detecting portion on the basis of angle information corresponding to said beam incidence position and a change therein.

30. The apparatus of Claim 3, further comprising pulse generating means for generating a pulse signal of a predetermined frequency, a counter for counting said pulse signal, selection means for successively changing over and outputting the outputs of the plurality of independent light receiving elements on the basis of the value of said counter, filter means for removing the signal of said predetermined frequency component from the output signal of said selection means,

comparison means for comparing the output signal of said filter means with a predetermined value, detecting means for detecting the value of said counter at the changing point of the output signal of said comparison means, and arithmetic means for calculating angle information corresponding to the beam incidence position by the use of the result of the detection by said detecting means.

31. The apparatus of Claim 2, wherein said circular ring-shaped light receiving portion is divided into a plurality of compartments by a plurality of concentric circles, and at least one of the compartments is used for offset level detection, and at least one other compartment is used for beam incidence position detection.

32. The apparatus of Claim 31, wherein a mask for intercepting light is used for said offset level detection.

33. A rotation detecting apparatus comprising:

two members rotatable relative to each other, at least one of said two members having the function of forming on the other member at least two beams moving on concentric circles while forming a track as a circle or an arc in conformity with said relative rotation;

a light receiving portion provided on said other member, said light receiving portion detecting the incidence positions of said at least two beams; and

an arithmetic system for adding angle information corresponding to two or more incidence positions selected from among a plurality of beam incidence positions detected by said light receiving portion to thereby calculate and output the angle between a straight line linking at least two incidence positions detected by said light receiving portion together and a predetermined reference line, the information of said relative rotation being detected by said angle calculation.

34. The apparatus of Claim 33, wherein said one member has at least two light emitting portions for producing said beams moving while describing said circle or arc.

35. The apparatus of Claim 34, wherein said at least two light emitting portions are disposed so that the centers of rotation of said beams moving while describing said circle or arc may coincide with the center of said light receiving portion.

36. The apparatus of Claim 33, wherein said one member has at least two light transmitting windows for

the incident light from the back side of said member to form said beams moving while describing said circle or arc.

37. The apparatus of Claim 33, further comprising a condensing optical system or an orifice for making said at least two beams into light spots on said light receiving portion.

38. The apparatus of Claim 33, wherein said one member has light deflecting means for changing the direction of incidence of the beams incident on said light receiving portion with the rotation of said one member.

39. The apparatus of Claim 38, wherein said light deflecting means has at least two reflecting members.

40. The apparatus of Claim 38, wherein said light deflecting means has at least two refracting members.

41. The apparatus of Claim 38, wherein said light deflecting means has a diffraction grating.

42. The apparatus of Claim 38, wherein said light deflecting means is formed with a plurality of patterns of a predetermined cross-sectional shape forming a

reflecting surface forming a predetermined angle with respect to the relative rotation plane of said one member, said patterns being continuously formed in parallel to said rotation plane.

43. The apparatus of Claim 42, wherein said patterns of said predetermined cross-sectional shape are linear grooves or projections, or at least triangular polygonal pyramidal recesses.

44. The apparatus of Claim 38, wherein said light deflecting means is formed with a plurality of patterns of a predetermined cross-sectional shape forming a refracting surface forming a predetermined angle with respect to the relative rotation plane of said one member, said patterns being continuously formed in parallel to said rotation plane.

45. The apparatus of Claim 44, wherein said patterns of said predetermined cross-sectional shape are linear grooves or projections, or at least triangular polygonal pyramidal recesses.

46. A beam rotation angle detecting method comprising:

the detection of the incidence positions of at least two beams moving on concentric circles while

describing a circle or an arc; and

the calculation of the angle between a straight line linking the detected at least two incidence positions together and a predetermined reference line.

47. The method of Claim 46, wherein said light reception uses a circular ring-shaped light receiving portion disposed substantially concentrically with the circle on which said beams move.

48. The method of Claim 47, wherein said light reception has the step of expecting an output from the light receiving portion provided in the circular ring shape, and taking in the output of said light receiving portion from the vicinity of a light receiving position expected from said output.

49. A rotation detecting method comprising:

the formation of at least two beams moving on concentric circles while forming a track as a circle or an arc by at least one of two members rotatable relative to each other onto the other member in conformity with said relative rotation;

the detection of the incidence positions of said at least two beams on said other member; and

the calculation of the angle between a straight line linking at least two incidence positions detected

by said light receiving portion together and a predetermined reference line, the information of said relative rotation being detected by said angle calculation.